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Claim Rejections Under 35 USC §103

The 05/23/02 Office Action indicates that claims 1-101 are rejected under 35 USC § 103(a) as being unpatentable over Loh et al (5,193,618), stating:

"Loh et al disclose a steam-foaming surfactant compositions comprising alpha olefin sulfonates and alkyl aromatic sulfonates (col. 3, lines 1-10). Loh et al specifically teach that alkyl aromatics include benzene and toluene and may be branched or linear with substituents in the primary or secondary positions (col. 3, lines 20-65). Loh et al further teach the inclusion of additional components (col. 4, lines 56-65) in addition to the surfactant foaming components

Note, see examples and claims.

Loh et al do not exemplify the two aromatics in an example.

It would have been obvious to one of ordinary skill in the art to combine the two alkyl aromatic sulfonates in combination with adjunct materials to produce the claimed composition because when two components are taught by the prior art for the same purpose in order to form a composition to be used for the same purpose the idea flow logically from them having been individually taught in the prior art (In re Kerkhoven, 205 USPQ 1069). Moreover, compounds, which are, position isomers or homologs are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties. In re Wilder, 563 F.2d 457, 195 USPQ 426 (CCPA 1977). See also In re May, 574 F.2d 1082, 197 USPQ 601 (CCPA 1978). Prior art structures do not have to be true homologs or isomers to render structurally similar compounds *prima facie* obvious. In re Payne, 606 F.2d 303, 203 USPQ 245 (CCPA 1979)."

With regards to the making a *prima facie* case of obviousness under 35 USC §103(a),

Applicant notes that MPEP section 706.02(j) sets forth the three basic criteria which must be met:

- "1) There must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings;
- 2) there must be reasonable expectation of success; and
- 3) the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based upon applicant's disclosure."

Although the Office Action purports to reject claims 1-101 under 35 USC § 103(a) as being unpatentable over Loh et al (5,193,618), the statement that provides the reason for the alleged obviousness in the Office Action is found after the word "because" in line 15 of page 3 of the Office Action, which states:

"...because when two components are taught by the prior art for the same purpose in order to form a composition to be used for the same purpose the idea flow logically from them having been individually taught in the prior art."

The 05/23/02 Office Action neglects to mention the main limitation in the alkyl aromatic sulfonates disclosed in Loh et al, which can be found between the sections cited in the Office Action at col. 3, lines 11-14, wherein it is specified that the alkyl aromatic sulfonate employed within the Loh et al invention are those which have alkyl groups having between 16-40 carbon atoms, preferably 20-30 carbon atoms, and more preferably 20-24 carbon atoms. In contrast, Applicants claims 11 and 13 specify that the alkyl groups in the compositions for which patent protection is sought contain between 7 and 16 carbon atoms, which means any number of carbon atoms selected from 8, 9, 10, 11, 12, 13, 14, and 15 carbon atoms per alkyl group. Thus, the teaching of Loh et al does not meet Applicants' claims. No teaching or suggestion is found in any of the prior art of record for changing the length of the alkyl chain of the surfactants used in the Loh et al reference.

As regards Applicant's instant claim 20, which specifies a water-soluble salt of an alkylaromatic sulfonate according to claim 1 that also contains, in one embodiment, calcium ions, this material is completely unexpected. In fact, the Loh et al reference indicates that precipitation of surfactants in the presence of di-valent metal ions and especially calcium

encountered in subterranean uses is a problem in the art (col. 1, line 66 to col. 2, line 11), which Loh et al. solve by adding "precipitation control agents (col. 2, line 31, line 45) which are described as being α -olefin sulfonate dimer (col. 2, line 48, claim 1). The very fact that the Loh et al reference indicates that there is a problem with precipitation of surfactants in the presence of di-valent metal ions is evidence of the lack of appreciation by the inventors in Loh et al of the enhanced water hardness tolerance property of the surfactants of Applicants' instant invention which is an inherent property of Applicants' surfactants that is conferred by virtue of the high level of 2-isomer, of which Loh et al makes no mention whatsoever. Rather than dealing with the root cause of the precipitation and providing a superior surfactant, as instant Applicants have, Loh et al. deals with the problem of precipitation by adding α -olefin sulfonate dimer as a fix for the precipitation. The treating of the symptom, rather than the cause, by Loh et al. proves that the alkyl aryl sulfonates used in Loh et al. are different than those claimed by Applicants. This is no big surprise, since Loh et al. makes no mention of 2-isomer content, as Applicants' claims are so limited. Further, there is nothing in the prior art of Loh et al which even remotely suggests altering the 2-isomer content of the surfactant. Thus, Applicants' claimed surfactants are not obvious in view of Loh et al.

It has been suggested by the Office Action that merely altering the chain length in a homologous series is an obvious modification; however, it is not true that Loh et al., and Applicants disclosure have the same purpose:

* The purpose of the Loh et al. reference is to provide a composition whereby undesirable precipitation of steam foam diversion surfactants is prevented while at the same time providing adequate thermal stability (col. 2, lines 28-34), and the thermal stability is maintained at temperatures on the order of 400° - 600° C (col. 2, lines 19-26).

* The purpose of Applicants' claimed invention is to provide detergent and cleaning compositions useful in applications including, inter alia, household cleaning.

One difference between surfactants mentioned in Applicants' specification and the Loh et al. reference is that the alkyl chain length in Applicants' surfactants is shorter than that in Loh et al. The reason for this is that Applicants' intended use is in common cleaning uses, which means that the surfactants are understood that they will be discharged into environmental water systems. Thus, biodegradability is an issue with Applicants' surfactants, as many species of fish are well-known by those in the alkylarene sulfonate surfactant art to be poisoned by surfactants of the type discussed herein having alkyl chains greater than about 15 carbon atoms, while biodegradability is not an issue for the Loh et al. reference because the Loh et al. compositions are injected into oil wells. Thus, there is a difference in purpose, and there is a reason why different alkyl chain lengths are appended to the aromatic ring in each of the cases of the Loh et al reference and Applicants' claimed invention. The different intended uses have different purposes in mind, and what works well in one use is not suitable for use in the other.

Since the purpose taught by the prior art is not the same as Applicants' purpose, then the conclusion which followed the word "because" in the Office Action after the statement which alleged equal purposes does not necessarily follow, namely that ideas flow logically from them having been individually taught in the prior art. Applicants' also note that the statement:

"Moreover, compounds which are position isomers or homologs are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties"

is actually evidence for the non-obviousness of Applicants' claimed subject matter, insomuch as

the results obtained when using the surfactants employed by Loh et al and when using the surfactants of Applicants' claimed invention are markedly different.

In order to arrive at Applicants' claims 1-101, the alkylarene surfactants mentioned only qualitatively in Loh et al would have to be modified in two ways. First, the alkyl chain length would need to be modified downward outside the range disclosed in Loh et al as being useful in their invention. Secondly, the content of the 2-isomer of the alkylarene surfactant would have to be increased to meet Applicant's claims.

Modifying the chain length of the alkyl portion which is bonded to the aromatic ring might be readily accomplished by supplying a different raw material during alkylation. However, there is no teaching, suggestion, or other indication as to why one of ordinary skill would want to make such an alteration, especially in view of the disclosure of Loh et al which specifies the desired chain lengths as being markedly different than those claimed by Applicants'. In the absence of a teaching, suggestion or motivation to make the modification necessary to the prior art to arrive at Applicants' claimed invention, there cannot be said to exist a prima facie case of obviousness with respect to claims 1-101 over Loh et al (5,193,618), and this rejection should be withdrawn.

As regards the second modification to the surfactants in Loh et al which would be necessary for arriving at all of Applicants' claim limitations, not only is there a lacking of motivation for altering the 2-isomer content in the Loh et al reference, since no mention is even made of this feature therein, but there is not even information provided in Loh et al that would give one of ordinary skill a reasonable chance for success in achieving such a result. This is no surprise, since oil recovery requires a large amount of surfactants, and surfactants having a high

level of 2-isomer were not available until Applicants' discovery of the use of fluoridated mordenites as the first-ever suitable catalyst for making commercial quantities of such materials, as described in the documents listed under the "Cross References" section of Applicants' instant specification. Loh et al failed to recognize the root cause of the precipitation problem, as evidenced by their choosing to treat the symptom of the problem (precipitation in the presence of di-valent metals) by adding α -olefin sulfonate dimer, rather than find a cure for the root cause of the problem.

Not only is there a lack of teachings, suggestion, or motivation in the prior art to make each of the two modifications necessary to the alkylarene surfactants of the Loh et al reference to meet all of the limitations of Applicants' claims individually, but for the combined change, the motivation is even more lacking.

Applicant respectfully submits that not all of the criteria necessary for making a prima facie case of obviousness under 35 USC 103 are present in the instant matter with respect to claims 1-101 in view of Loh et al. Thus, the rejection of claims 1-101 under 35 USC 103(a) must be withdrawn.

The 05/23/02 Office Action indicates that claims 1-101 are rejected under 35 USC §103(a) as being unpatentable over Wall et al. (5,005,644) , stating that:

"Wall et al disclose foam-forming surfactant composition comprising surfactants such as alkyl aromatics sulfonates being either linear or branched alkyl benzene sulfonates or alkyl toluene sulfonates (col. 9, lines 50-56). In addition said composition includes additives such as alpha olefin sulfonates or other adjunct materials.

Wall et al do not exemplify the two aromatics in an example.

It would have been obvious to one of ordinary skill in the art to combine the two alkyl aromatic sulfonates in combination with adjunct materials to

produce the claimed composition because when two components are taught by the prior art for the same purpose in order to form a composition to be used for the same purpose the idea flow logically from them having been individually taught in the prior art (In re Kerkhoven, 205 USPQ 1069). Moreover, compounds, which are, position isomers or homologs are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties. In re Wilder, 563 F.2d 457, 195 USPQ 426 (CCPA 1977). See also In re May, 574 F.2d 1082, 197 USPQ 601 (CCPA 1978). Prior art structures do not have to be true homologs or isomers to render structurally similar compounds prima facie obvious. In re Payne, 606 F.2d 303, 203 USPQ 245 (CCPA 1979)."

The aforesaid arguments in refutation of the prima facie case of obviousness concerning the Loh et al reference are applicable to the 35 USC § 103(a) rejection of claims 1-101 over Wall et al. The Wall et al reference, like that of Loh et al, finds it necessary to utilize alpha olefin sulfonate dimers to control precipitation of the surfactant. Again, this is evidence that the inventors in Wall et al were unaware of the effect of increasing the 2-isomer content of the alkylarene sulfonate surfactant to preclude the necessity of dimer addition. Thus, it is apparent that high 2-isomer content is not inherent feature of the surfactants disclosed in Wall et al. Applicants are thus unable to locate any teaching or suggestion in the Wall et al reference to increasing the 2-phenyl isomer content of an alkyl arene sulfonate disclosed therein.

In addition to altering the 2-phenyl isomer content of the surfactants disclosed in Wall et al., another alteration which would be necessary to arrive at Applicants' claims is to modify the alkyl chain from a branched one (coll 2, lines 55 -68) to a linear one. As Wall et al teaches the use of alkylarene sulfonates having branched alkyl chains, and no

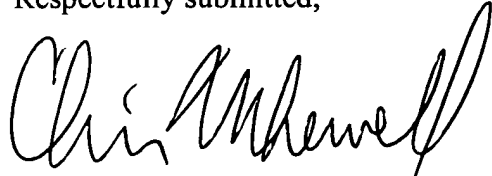
motivation exists in the prior art to change these branched chains to linear chains, as Applicants' claims are so limited, Applicants' respectfully submit that a prima facie case of obviousness cannot exist concerning claims 1-101 based on the Wall et al reference, and this rejection must be withdrawn. Given that two modifications of the Wall et al reference are necessary to arrive at Applicants' instant claims, and that there is no teaching or motivation for making either of the necessary modifications alone by themselves, the existence of a teaching or suggestion for simultaneously making both required modifications to the surfactants in Wall et al to arrive at Applicants' claims is even more extremely remote.

Further, the carbon number of the alkyl chain attached to the aromatic ring in the surfactants of Wall et al is outside the range of Applicants' range of carbon number, which is a third difference between this piece of prior art and Applicants' claims, for which there is no teaching or suggestion in any of the prior art of record to modify.

Applicants appreciate the fact that there are no rejections of any of the pending claims under 35 USC §102. This is because the present claimed invention is in fact novel over the prior art. Further, instant inventors should be awarded a patent on their invention since none of the prior art teaches or even remotely suggests the plurality of alterations which would be necessary to modify the prior art in order to have it arrive at Applicants' claimed invention.

Applicants' look forward to receiving a Notice of Allowance in connection with their pending application at the soonest possible time. Thank you for your consideration.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Chris Whewell". The signature is fluid and cursive, with the first name "Chris" and last name "Whewell" clearly distinguishable.

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